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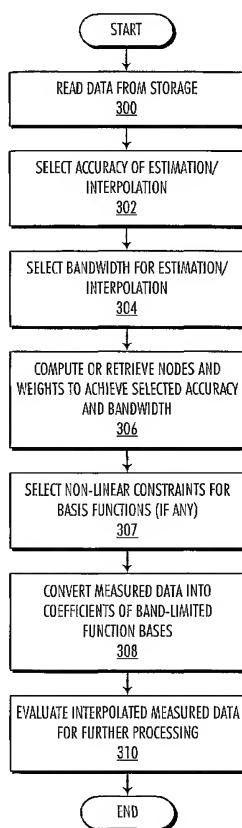
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[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR EFFICIENT DATA ACQUISITION AND INTERPOLATION



(57) **Abstract:** A method and apparatus for performing efficient interpolation of data sequences or signals is disclosed. A preferred embodiment of the present invention determines a suitable Gaussian quadrature to match given bandwidth and accuracy requirements. This Gaussian quadrature is then used to construct a suitable family of interpolating functions to represent a physical data sequence or signal (which, in a preferred embodiment, is seismic data). In one embodiment, Gaussian quadratures are constructed using trigonometric moments of exponential functions. In an alternative embodiment, an interpolating function is constructed using prolate spheroidal wave functions (PSWFs) by adopting Gaussian quadrature points corresponding to a family of PSWFs as interpolation points. The particular family of PSWFs utilized is determined in accordance with bandwidth and accuracy requirements.



- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
- *of inventorship (Rule 4.17(iv))*

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